

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of measuring the quality of a circuit-switched service transmitted on a traffic channel between a transmitter and a receiver in a cellular radio network, comprising:

the transmitter ~~transmits~~ transmitting user data to the receiver using data frames of the traffic channel;

the transmitter omitting transmission of~~does not transmit~~ all data frames of the traffic channel to the receiver ~~because~~ based on a determination that the user data are missing;

the transmitter ~~transmits~~ transmitting control data to the receiver using associated control channels of the traffic channel;

the transmitter ~~calculates~~ calculating the a number of frames transmitted to the receiver on the traffic channel during a certain time period;

the receiver ~~calculates~~ calculating the a number of all frames received and correctly decoded ~~correctly~~ during that a certain time period; and

calculating a quality value ~~is calculated~~ for a service to be transmitted on the traffic channel during a that certain time period by subtracting the number of frames transmitted during ~~said that certain time~~ period from the number of frames received and correctly decoded during ~~said that certain time~~ period and by dividing the difference obtained by the number of frames transmitted during ~~said that certain time~~ period.

2. (Currently Amended) A The method of ~~according to~~ claim 1, wherein the transmitter transmits silence descriptor frames in place of ~~some~~ data frames, if the user data are missing.

3. (Currently Amended) A The method of ~~according to~~ claim 2, wherein comfort noise is inserted into the silence descriptor frame, if the service is a speech transmission service.

4. (Currently Amended) A ~~The~~ method ~~of according to~~ claim 2, wherein predetermined data are inserted into the silence descriptor frame, if the service is a data transmission service.

5. (Currently Amended) A ~~The~~ method ~~of according to~~ claim 1, wherein the transmitter is in ~~the~~ a network part of the cellular radio network and the receiver is in a subscriber terminal;

the receiver is configured to signal an indication of a signals the number of all frames received on the traffic channel and correctly decoded ~~correctly~~ to the transmitter; and the quality value is calculated for a downlink in the network part.

6. (Currently Amended) A ~~The~~ method ~~of according to~~ claim 5, wherein signalling of the signalled number of received frames replaces a bit error ratio estimate, ~~such as parameter RX_QUAL_SUB~~, which is calculated by the receiver based on ~~from some~~ received frames and is subsequently ~~to be~~ signalled to the transmitter.

7. (Currently Amended) A ~~The~~ method ~~of according to~~ claim 5, wherein signalling of the signalled number of received frames replaces a bit error ratio estimate, ~~such as parameter RX_QUAL_FULL~~, which is calculated by the receiver from all ~~received~~ frames received on the traffic channel and is subsequently ~~to be~~ signalled to the transmitter.

8. (Currently Amended) A ~~The~~ method ~~of according to~~ claim 6, wherein the bit error ratio estimate ~~to be~~ signalled to the transmitter is replaced with a bit error probability, ~~such as parameter BEP_MEAN~~, which is calculated based on ~~from the~~ frames received by the receiver.

9. (Currently Amended) A ~~The~~ method ~~of according to~~ claim 6, wherein the bit error ratio estimate or bit error probability ~~to be~~ signalled to the transmitter is calculated based only on ~~from~~ correctly decoded frames.

10. (Currently Amended) A ~~The~~ method ~~of according to~~ claim 1, wherein the transmitter is in a subscriber terminal and the receiver in ~~the~~ a network part of the cellular radio network;

the transmitter signals the number of all frames transmitted on the traffic channel to the receiver; and

the quality value for an uplink is calculated in the network part.

11. (Currently Amended) ~~A~~ The method of according to claim 1, wherein the calculated quality value is used for controlling power control of the traffic channel and/or handover and/or link adaptation and/or optimization of ~~the~~ a cellular radio network function.

12. (Currently Amended) A cellular radio network comprising a transmitter and a receiver, which communicates with the transmitter over a traffic channel on which a circuit-switched service is transmitted and which consists of data frames and associated control channel frames;

the transmitter comprising:

means for transmitting user data to the receiver using data frames of the traffic channel;

~~the transmitter comprising~~ means for omitting transmission not transmitting all data frames of the traffic channel to the receiver based on a determination that ~~when~~ the user data are missing;

~~the transmitter comprising~~ means for transmitting control data to the receiver using associated control channel frames of the traffic channel; and

~~the transmitter comprises~~ means for calculating ~~the~~ a number of all frames transmitted to the receiver on the traffic channel during a certain time period;

the receiver ~~comprises~~ comprising:

means for calculating ~~the~~ a number of all frames received on the traffic channel and correctly decoded ~~correctly~~ during a that certain time period; and

the cellular radio network comprising~~comprises~~:

means for calculating a quality value for a service ~~to be~~ transmitted on the traffic channel during a that certain time period by subtracting the number of frames transmitted during ~~said~~ that certain time period from the number of frames received and correctly decoded during ~~said~~ that certain time period, and by dividing the difference obtained by the number of frames transmitted during ~~said~~ that certain time period.

13. (Currently Amended) ~~A~~ The cellular radio network of ~~according to~~ claim 12, wherein the transmitter transmits silence descriptor frames in place of ~~some~~ data frames, if the user data are missing.

14. (Currently Amended) ~~A~~ The cellular radio network of ~~according to~~ claim 13, wherein comfort noise is inserted into the silence descriptor frame, if the service is a speech transmission service.

15. (Currently Amended) ~~A~~ The cellular radio network of ~~according to~~ claim 13, wherein predetermined data are inserted into the silence descriptor frame, if the service is a data transmission service.

16. (Currently Amended) ~~A~~ The cellular radio network of ~~according to~~ claim 12, wherein
the transmitter is in ~~the~~ a network part of the cellular radio network and the receiver in a subscriber terminal;
the receiver further comprises means for signalling an indication of the a number of ~~all~~ frames received on the traffic channel and correctly decoded ~~correctly~~ to the transmitter;
and
the means for calculating the quality value are in the network part.

17. (Currently Amended) ~~A~~ The cellular radio network of ~~according to~~ claim 16, wherein ~~the signalling of the~~ signalled number of received frames replaces a bit error ratio estimate, ~~such as parameter RX_QUAL_SUB~~, which is calculated by the receiver from ~~some~~ received frames and is ~~to be~~ subsequently signalled to the transmitter.

18. (Currently Amended) ~~A~~ The cellular radio network of ~~according to~~ claim 16, wherein ~~signalling of the~~ signalled number of received frames replaces a bit error ratio estimate, ~~such as parameter RX_QUAL_FULL~~, which is calculated by the receiver from all ~~received frames~~ received on the traffic channel and is ~~to be~~ subsequently signalled to the transmitter.

19. (Currently Amended) A The cellular radio network of ~~according to~~ claim 17, wherein the a bit error ratio estimate ~~to be~~ signalled to the transmitter is replaced with a bit error probability, ~~such as parameter BEP_MEAN,~~ which is calculated from the frames received on the traffic channel by the receiver.

20. (Currently Amended) A The cellular radio network of ~~according to~~ claim 17, wherein the bit error ratio estimate or bit error probability ~~to be~~ signalled to the transmitter is calculated based only on ~~from~~ correctly decoded frames.

21. (Currently Amended) A The cellular radio network of ~~according to~~ claim 12, wherein

the transmitter is in a subscriber terminal and the receiver in ~~the~~ a network part of the cellular radio network; and

the transmitter further comprises means for signalling an indication of a ~~the~~ number of all frames transmitted to the receiver on the traffic channel; and

wherein the means for calculating the quality value are in the network part.

22. (Currently Amended) ~~A cellular radio network according to~~ claim 12, wherein the calculated quality value is used for controlling power control of the traffic channel and/or handover and/or link adaptation and/or optimization of ~~the~~ a cellular radio network function.

23. (New) A cellular radio network element, comprising
means for transmitting user data to a subscriber terminal using data frames of a traffic channel of a circuit-switched service;

means for omitting transmission of all data frames of the traffic channel to the subscriber terminal based on a determination that the user data are missing;

means for transmitting control data to the subscriber terminal using associated control channel frames of the traffic channel;

means for calculating a number of frames transmitted to the subscriber terminal on the traffic channel during a certain time period;

means for receiving, from the subscriber terminal, an indication of a number of frames received on the traffic channel and correctly decoded in the subscriber terminal;

and

means for calculating a quality value for a service transmitted on the traffic channel during the certain time period by subtracting the number of frames transmitted during the certain time period from the number of frames received and correctly decoded during that certain time period, and by dividing the difference obtained by the number of frames transmitted during that certain time period.

24. (New) The cellular radio network element of claim 23, wherein the means for transmitting user data transmits silence descriptor frames in place of data frames, if the user data are missing.

25. (New) A cellular radio network element comprising:
means for receiving user data from a transmitter using data frames of a traffic channel;

means for receiving control data from the transmitter using associated control channel frames of the traffic channel;

means for receiving, from the transmitter, an indication of the number of frames transmitted to the receiver on the traffic channel;

means for calculating a number of all frames received on the traffic channel and correctly decoded during a certain time period; and

means for calculating a quality value for a service transmitted on the traffic channel during that certain time period by subtracting a number of frames transmitted during that certain time period from the number of frames received and correctly decoded during that certain time period, and by dividing the difference obtained by the number of frames transmitted during that certain time period.

26. (New) The cellular radio network element of claim 25, wherein the means for receiving user data receives silence descriptor frames in place of data frames, if the user data are missing.

27. (New) A cellular radio network element, comprising:
a transceiver configured to transmit user data to a subscriber terminal using data frames of a traffic channel of a circuit-switched service and to omit transmission of all data frames of the traffic channel to the subscriber terminal based on a determination that the

user data are missing, wherein the transceiver is further configured to transmit control data to the subscriber terminal using associated control channel frames of the traffic channel and to calculate a number of frames transmitted to the subscriber terminal on the traffic channel during a certain time period, wherein the transceiver is further configured to receive, from the subscriber terminal, an indication of a number of frames received on the traffic channel and correctly decoded in the subscriber terminal during that certain time period;

wherein the transceiver is further configured to calculate a quality value for a service transmitted on the traffic channel during the certain time period by subtracting the number of frames transmitted during the certain time period from the number of frames received and correctly decoded during that certain time period, and by dividing the difference obtained by the number of frames transmitted during that certain time period.

28. (New) The cellular radio network element of claim 27, wherein the transceiver transmits silence descriptor frames in place of data frames, if the user data are missing.

29. (New) A cellular radio network element comprising:
a receiver configured to receive user data from a transmitter using data frames of a traffic channel and to receive control data from the transmitter using associated control channel frames of the traffic channel; the receiver being further configured to receive, from the transmitter, an indication of the number of frames transmitted to the receiver on the traffic channel and configured to calculate a number of all frames received on the traffic channel and correctly decoded during a certain time period;

wherein the receiver is further configured to calculate a quality value for a service transmitted on the traffic channel during that certain time period by subtracting a number of frames transmitted during that certain time period from the number of frames received and correctly decoded during that certain time period, and by dividing the difference obtained by the number of frames transmitted during that certain time period.

30. (New) The cellular radio network element of claim 29, wherein the receiver is further configured to receive silence descriptor frames from the transmitter in place of data frames, if user data are missing.

31. (New) An article of manufacture for measuring the quality of a circuit-switched service transmitted on a traffic channel between a transmitter and a receiver in a cellular radio network, the article of manufacture comprising a machine readable medium containing one or more programs which when executed implement the steps of:

transmitting user data to a subscriber terminal using data frames of a traffic channel of a circuit-switched service;

omitting transmission of all data frames of the traffic channel to the subscriber terminal based on a determination that the user data are missing;

transmitting control data to the subscriber terminal using associated control channel frames of the traffic channel;

calculating a number of frames transmitted to the subscriber terminal on the traffic channel during a certain time period;

receiving, from the subscriber terminal, an indication of a number of frames received on the traffic channel and correctly decoded in the subscriber terminal; and

calculating a quality value for a service transmitted on the traffic channel during the certain time period by subtracting the number of frames transmitted during the certain time period from the number of frames received and correctly decoded during that certain time period, and by dividing the difference obtained by the number of frames transmitted during that certain time period.

32. (New) The article of manufacture of claim 31, wherein the one or more programs further implement receiving of silence descriptor frames in place of data frames, if user data are missing.